ALTEC LANSING®

the sound of experience

3300A
Mixing Consoles

Operating Instructions

ALTEC LANSING CORPORATION
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1 ELECTRICAL

1.1 115 Vac 50/60 Hz Operation

The mixing console is provided with the voltage select switch in the 115 Vac position. Its power supply design allows it to be powered from 100 Vac to 120 Vac lines in this switch position.

1.2 230 Vac 50/60 Hz Operation

The mixing console may be powered by line voltages from 220 Vac to 240 Vac by switching the voltage select switch to the 230 Vac position. However, the ac line fuse must be changed. Refer to Table I for proper fuse value.

WARNING: *Verify that the voltage select switch is in the desired position and the proper fuse is in place for the intended ac line voltage* ***BEFORE*** *applying power to the mixing console.*

2 INSTALLATION

2.1 Rack Mounting

The 3308A mixer may be placed in a standard 19 inch equipment rack. It requires 17.5 inches of vertical space (10 standard EIA vertical rack spaces). For more information on rack-mount installation, refer to Section 5 and Figure 9 of this manual.

2.2 Ventilation

The 3300A series mixing consoles should not be used in areas where the ambient temperature exceeds 60°C (140°F).

Table I. Fuse Selection Chart

AC LINE VOLTAGE	AC LINE FUSE
100 V — 120 V (8 and 16 ch only)	400 mA/250 V
100 V — 120 V (24 ch only)	500 mA/250 V
220 V — 240 V	250 mA/250 V

3 SIGNAL CONNECTIONS

3.1 Input Connections

Balanced microphone inputs may b made to the 3-pin XLR-type con nector. Balanced line inputs may b made to the ¼-inch phone (TRS connector. For single-ended inputs strap the low (−) input (pin 3 o XLR or *Ring* on ¼-inch phone) t ground. Otherwise, the electronicall balanced input stage will see 6 dI less input signal level than with a balanced input. Refer to Figure 1 fo typical input connections.

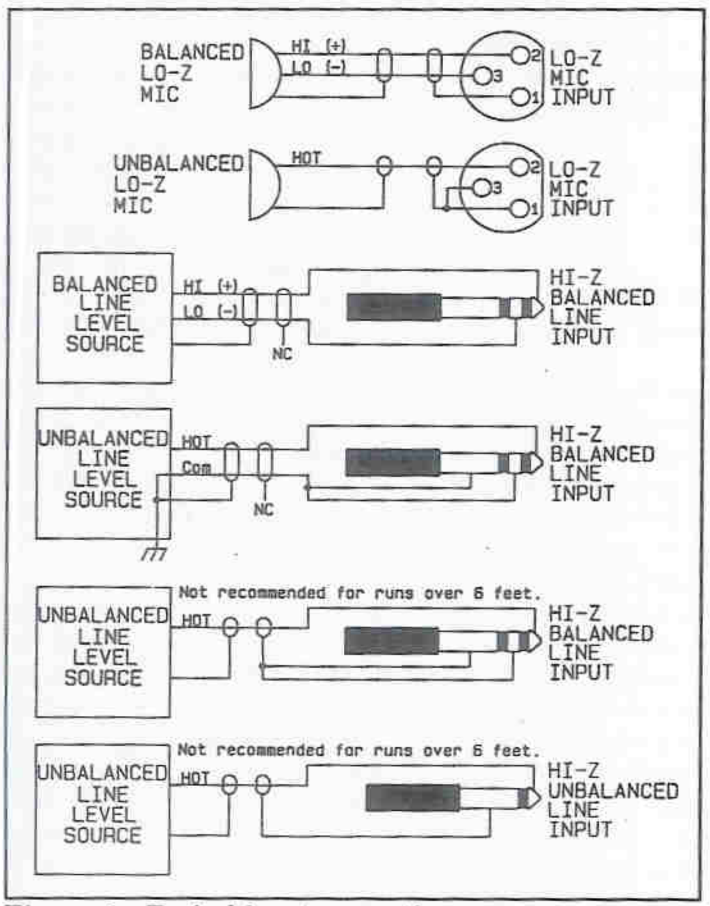


Figure 1. Typical input connections.

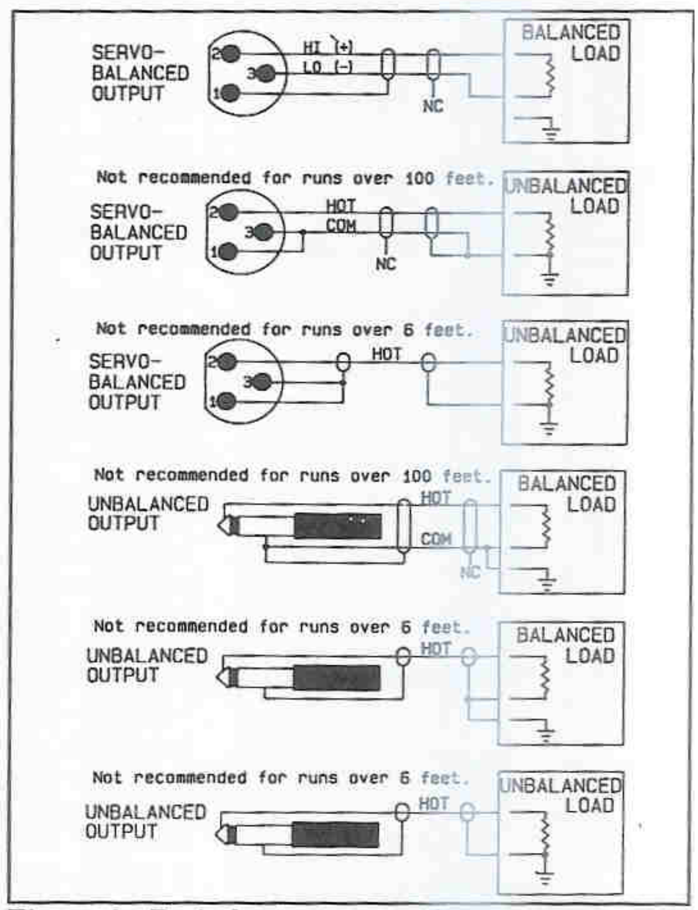


Figure 2. Typical output connections.

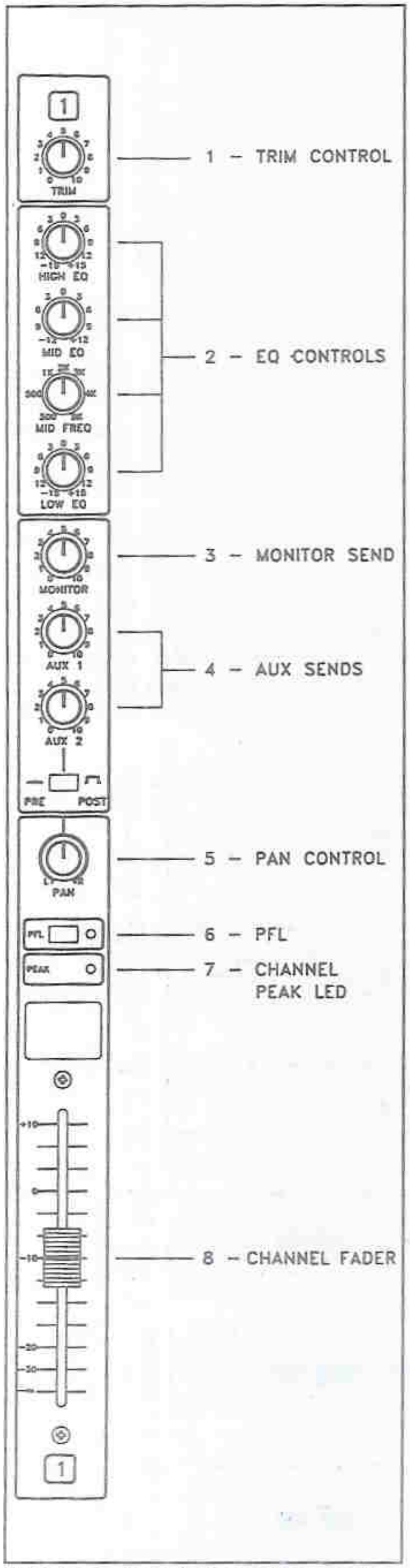


Figure 4. Input channel controls.

3.2 Output Connections

The main outputs of the mixing console are electronically servo-balanced. Balanced output connections may be made to the male 3-pin XLR-type connectors. For single-ended outputs, strap the low (−) output (pin 3 on XLR or *Ring* on ¼-inch phone) to ground. Otherwise, the electronically servo-balanced output stage will produce 6 dB less output signal level than with a balanced output connection. Unbalanced connections may be made to the other ¼-inch phone (TRS) connectors. Refer to Figure 2 for typical output connections.

3.3 Insert Connections

Signal processing equipment may easily be inserted in the signal path by using the ¼-inch phone (TRS) insert connectors. The external device must have line level unbalanced inputs and outputs. The output signal from the mixing console is on the *Tip* and the input signal is on the *Ring*. The *Sleeve* is ground. Refer to Figure 3 for a typical insert connection.

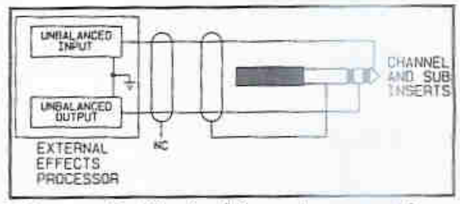


Figure 3. Typical insert connection.

4 OPERATION

4.1 Input Channel Controls (Refer to Figure 4.)

The input channel is the beginning of the signal amplification chain of the mixer. Each input channel will accept one signal source which may be equalized, have effects added and sent to the monitor and main system for the audience to hear. Each input has a low-impedance microphone input (the 3-pin XLR connector) and a high-impedance microphone or line input (¼-inch phone jack). The line input will accept signals from an instrument, high-impedance microphone, tape/CD player, keyboard or electronic drums or almost any other audio source. Always make sure that the channel fader (see Figure 4) and/or master faders (see Figure 5) are down before plugging or unplugging input sources.

1. ***TRIM Control:*** This control adjusts the gain of the input amplifier to accommodate the wide variation in signal strength presented to the mixer by the endless variety of signal sources. The TRIM control allows the amplification of each individual input source to be optimized. Correct setting of the TRIM control results in the best signal-to-noise ratio (no hiss), the greatest dynamic range, and the freedom from overload distortion.

   To set the TRIM control correctly, first set the channel fader at minimum and depress the channel PFL switch. Make sure the source (mic, instrument) that is plugged into the channel is used at its nominal performance level. Increase the TRIM level until the level of the PFL meter reaches 0 VU. Gradually bring the channel fader up to the desired listening level. This insures that nominal level is maintained throughout the input channel.

   If the level is too low in the TRIM's gain circuit, hiss will occur. If the level is too high in the TRIM circuit, overload distortion will occur. Keeping the channel faders at nominal level with proper setting of the TRIM control will keep the system sounding its best and its quietest.

2. ***EQ Controls:*** Equalization can be more simply described as sophisticated tone control. The EQ circuits used in the 3300A series have a substantial amount of sound shaping capability.

   This wide range can be a bonus when dealing with widely-varying instrument signals, poor acoustics or other problems. The EQ should be used sparingly, however, for the best results. Too liberal use of the EQ can cause phasing problems, add noise, and use up a lot of amplifier power.

   2A. ***HIGH EQ:*** The high EQ circuit is a shelving type filter at 10 kHz with a ±15 dB range. It controls the treble content of the input signal. Turning the control counterclockwise decreases the amount of treble, clockwise increases it.

   2B. ***MID EQ:*** The mid EQ circuit is a peaking type filter with a ±15 dB range. It controls the midrange content of the input signal. Turning the control counterclockwise decreases the amount of midrange, clockwise increases it.

   2C. ***MID Frequency:*** The mid frequency circuit controls the frequency range from 300 Hz to 5 kHz of the MID EQ control. By varying the FREQUENCY, different tonal perspectives can be created. The sweepable frequency gives much more control flexibility.

   2D. ***LOW EQ:*** The low EQ circuit is a shelving type filter at 100 Hz with a ±15 dB range. It controls the bass content of the input signal. Turning the control counterclockwise decreases the amount of bass, clockwise increases it.

3. ***MONITOR Send:*** The monitor send control sets the level of that input signal in the monitor mix. It is independent of all input channel controls except the TRIM control. It is not affected by the channel EQ controls or slide fader. Thus, it is independent of, and not affected by, changes in the main or house mix.

4. ***AUX Sends:*** The AUX 1 send control sets the level of that signal in the AUX 1 mix and is post-fader, which means that it is affected by the gain setting of the fader. The AUX 1 send may also be used as a mono send for recording.

   The AUX 2 send control sets the level of that input signal in the AUX 2 mix and is switchable PRE or POST fader. In the PRE position, it serves as another MONITOR OUT, and in the POST position, another EFFECTS OUT.

5. ***PAN Control:*** Short for "panoramic potentiometer", this control allows the channel's input signal to be placed within the stereo image by assigning more or less of the signal to the left or right subgroup controls. Turning the panpot to the left of center moves the apparent source toward the left channel. Turning the panpot to the right of center moves the apparent source toward the right channel. Centering the control makes the apparent source centered between the channels. If all inputs are panned center, the result is mono.

   Some users pan all the instruments to one side and the vocals to the other and use the subgroup controls to balance them.

6. ***PFL:*** PFL(pre-fader listen) allows the operator to preview any pre-fader signal individually or in combination through the headphone output. To activate the PFL simply depress the appropriate switches. The status indicator will light indicating which pre-fader signals are being monitored. When the PFL circuit is engaged by depressing a PFL switch, both the right meter and the headphone circuit will monitor the audio level of the selected channel(s).

   In the normal position (all PFL switches off), the right meter monitors the METER switched bus, and the headphone circuit monitors the output of the SUB L and SUB R outputs. The audio level of the headphone jack is controlled by the PHONES control.

7. ***Channel PEAK LED:*** The channel PEAK LED monitors the input channel circuit for clipping or overload (both before and after the EQ section). If it lights, the signal is bordering on distortion. This will be heard in the output as a harsh, blaring sound on volume peaks. This might be caused by excessive boost in the channel equalization controls, or a TRIM control setting that is too high for the input signal. Generally, readjusting the TRIM control will cure this undesired condition.

8. ***Channel Fader:*** The slide fader controls the output level of the channel as it is fed to the subgroups. The control should be normally set around the "0" mark (nominal level). At this point, the signal level is high enough to keep noise from creeping in and low enough to insure plenty of headroom and

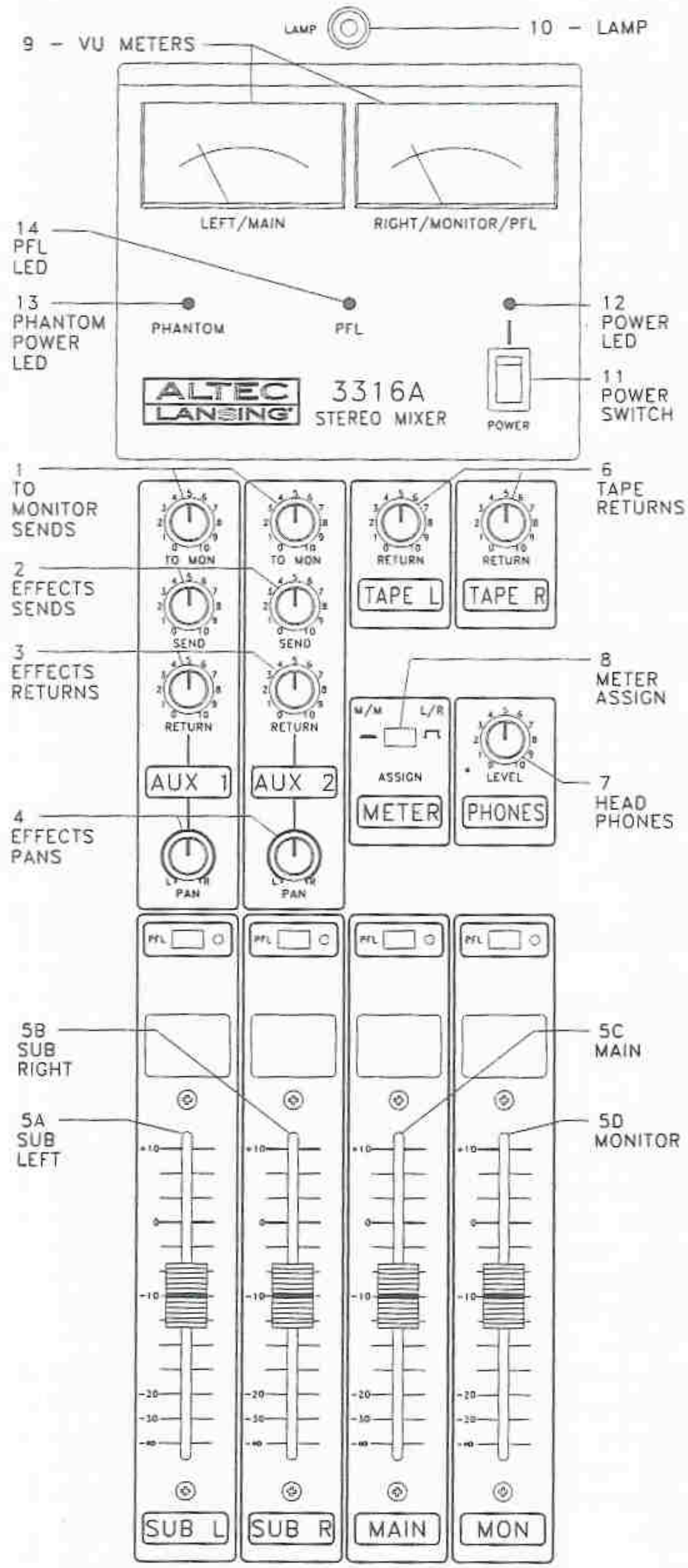


Figure 5. Output section controls.

freedom from clipping distortion. If the fader must run wide open to get enough level, turn up the TRIM control judiciously or increase the level setting of the left and right subgroup controls. Conversely, if the fader must be pulled way back to get the right level, the TRIM control or stereo subgroup should be adjusted. Adjust the TRIM control if the PEAK LED lights, otherwise adjust the stereo subgroups. For optimum performance, the channel FADERS should be run close to the "0" mark.

4.2 Output Section Controls

(Refer to Figure 5.)

1. ***TO MON Send (AUX 1, AUX 2):*** The TO MON level control determines the amount of externally generated effects signals in the monitor mix. With the use of this control, the performers can hear the added effects in their monitors.

2. ***Effects SEND (AUX1, AUX2):*** The effects SEND control sets the level of the signal appearing at the effects send output jack(s) going to any type of outboard effects device(s) such as a digital reverb, flanger, compressor/limiter, etc. The source of this signal is via the individual AUX 1 and AUX 2 send level controls on each input channel.

3. ***Effects RETURN (AUX 1, AUX 2):*** The effects RETURN level control determines the amount of externally generated effects signals in the main mix. This signal is mixed into the left and right stereo sub channels via the AUX 1 and AUX 2 PAN control(s).

4. ***PAN Control (AUX 1, AUX 2):*** The effects PAN control (AUX 1, AUX 2) directs the signal coming from the effects

RETURN level control(s) into the left and/or right sub channels. The control works in an identical way to the input channel PAN control.

5. ***Master Section Controls:*** The master section controls affect the subgroup, main, and monitor output levels.

   The use of subgroups can be shown by this example: If the input channel PAN controls are set fully clockwise for all the vocals, then the SUB R fader has been assigned as a "vocal submaster". If the SUB R fader is raised or lowered, the vocal level in the mix can be set while preserving the input channel balance set among the vocalists.

   5A. ***SUB L (Left Submaster):*** Controls the volume of the left stereo output channel. It is also used as a subgroup master.

   5B. ***SUB R (Right Submaster):*** Controls the volume of the right stereo output channel. It is also used as a subgroup master.

   5C. ***MAIN Master:*** The MAIN (monaural) output is the summed mix of the left and right stereo outputs. The MAIN master controls the volume of the output.

   5D. ***MON (Monitor Master):*** Controls the volume of the monitor output signal. The monitor output is a mix of the individual channel monitor sends.

6. ***TAPE L and TAPE R:*** These controls adjust the level of the tape left and tape right returns.

7. ***PHONES (Headphone Level):*** The PHONES gain control sets the level at the headphone jack (front panel on the **3324A** and the **3316A**; top panel on the **3308A**). Any signal selected by depressing a PFL switch will be monitored through the headphone jack. Without any of the PFL switches depressed, the headphone circuit monitors the left and right subgroup outputs in stereo.

8. ***METER Assignment Switch:*** A push-push switch is provided to allow the user to select the points in the circuit which are monitored by the VU meters. When the switch is depressed, the indication will be the audio level at the MAIN and MONitor outputs. In the other (non-depressed) position, signal level at the SUB Left and SUB Right outputs will be shown.

9. ***VU Meters:*** Two "B" scale analog VU meters with integral peak lights are used to indicate signal level at selected points in the circuit (see meter assignment switch and PFL switches). The meter scale indicates a range from −20 dB to +4 dB with 0 VU = +4 dBu, a standard in the industry. The integral peak light, located in the upper right-hand corner of each meter, shows when the output is above the +14 dB level and the headroom is being rapidly exhausted and distortion is imminent. The meters read either left/right stereo, or main/monitor level. If any of the PFL switches are depressed, the right meter will monitor the PFL bus signal. A PFL LED is provided on the meter bridge to acknowledge the condition.

10. ***LAMP Connector:*** A BNC-type socket is provided at the top of the mixer panel to accommodate a Littelite® gooseneck lamp to allow operation of the board in low-light conditions. These lamps are available in different lengths from many professional sound dealers and attaches without tools. The LAMP connector can accommodate either normal or high intensity lamps.

11. ***POWER Switch:*** The power switch is used to turn the main ac power on and off.

12. ***POWER Indicator:*** This LED (green) is illuminated when the main ac power is on.

13. ***PHANTOM Power Indicator:*** This LED (red) indicates when phantom power is present at the microphone inputs.

14. ***PFL Indicator:*** This LED (amber) indicates when the PFL circuit is activated and shows that the right meter is reading the PFL bus signal level.

4.3 Rear Panel Input Connectors

(Refer to Figure 6.)

The **3300A** series mixer can accept program material covering a dynamic range of over 100 dB. All of the line inputs can safely accept signal levels up to +20 dBu. (See specifications for details.) All line inputs are made through standard ¼-inch phone jacks (except for TAPE inputs). Several of the inputs that directly access the mix buses can be used to stack mixers together without using up an input channel. The stacking group includes the AUX 1, AUX 2, and MONITOR inputs. The AUX return inputs may also be used as stacking inputs. For stereo subgroup stacking, set the AUX 1 PAN control to L, and the AUX 2 PAN control to R and use AUX 1 and 2 RETURNS for left and right stacking, respectively.

1. ***Balanced Low-Z Mic Input:*** A female 3-pin XLR-type connector is used for balanced low-impedance microphones. The MIC INPUT is actively

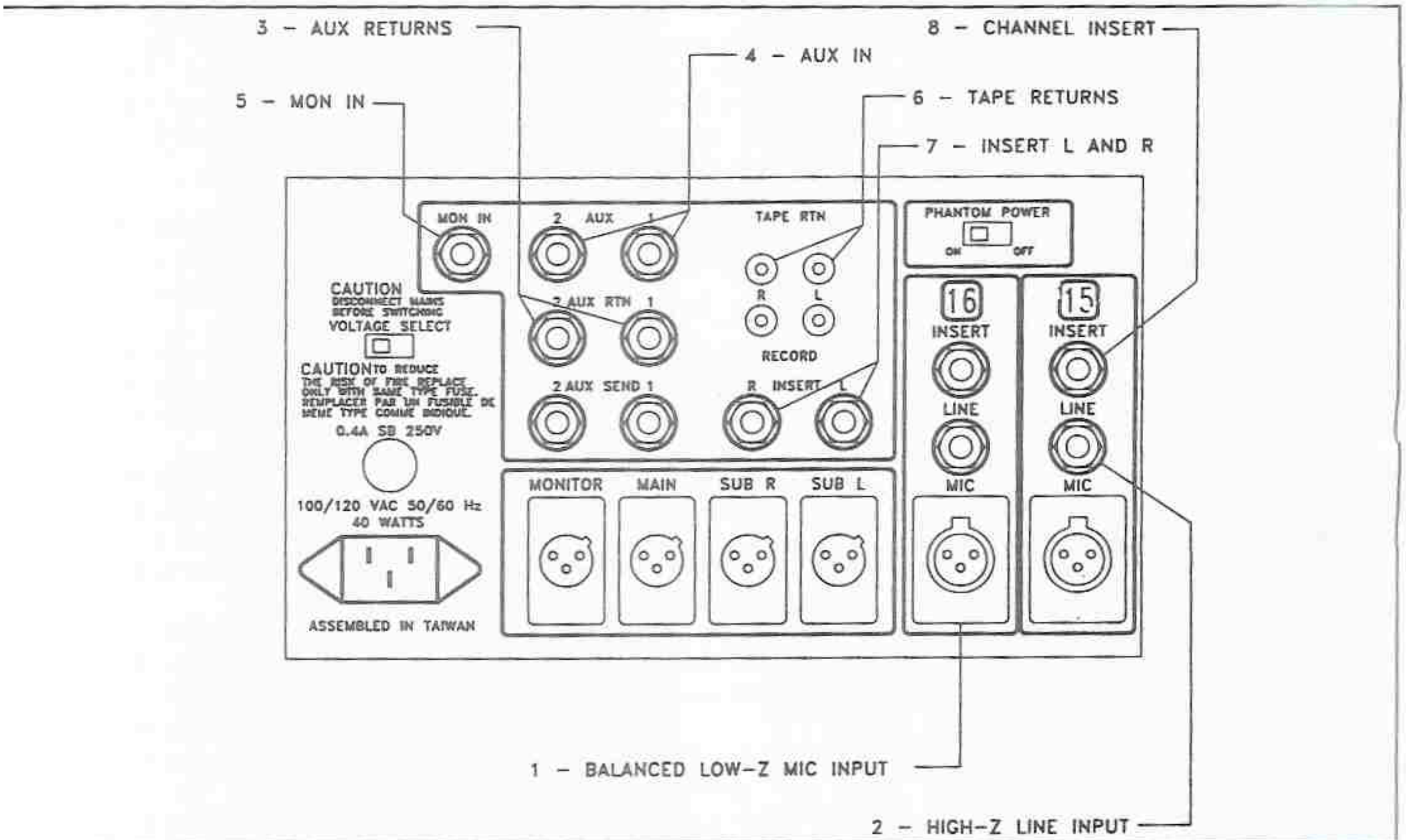


Figure 6. Rear panel input connectors.

balanced; active balancing allows elimination of the input transformer (along with its limitations) while maintaining the RF and hum rejection of a good transformer-coupled input.

It is important during operation or testing of the mixer that all faders remain fully down whenever the mic input is not *properly* terminated with a microphone or an equivalent 150-ohm source. An open mic input invites the introduction of high noise levels which could produce lower quality sound or an incorrect test measurement.

2. ***High-Z Line Input:*** A standard ¼-inch phone jack is used for balanced or unbalanced line level signals. Examples of these signals include most electronic keyboards, drum machines and synthesizers, tape decks, CD players, etc. All input channel controls, including the variable TRIM control, affect the LINE input. Maximum input level before preamp clipping is +24 dBu (12.3 Vrms).

   If a sufficient signal level is not possible with the TRIM control at its furthest clockwise position, the input signal must then be treated as a mic level signal and connected to the microphone input. If necessary, use an appropriate balancing transformer or a direct box with the microphone (XLR) input.

3. ***AUX RETURN (AUX 1 and AUX 2):*** The AUX RETURN jack(s) feed signals to the subgroup buses. The signal is controlled by the RETURN and PAN front panel controls.

4. ***AUX IN (AUX 1 and AUX 2):*** The AUX IN jack(s) will put signals directly into the respective AUX bus. Crosstalk and buffering protection are provided by the input circuit and the signal level is controlled by the external source.

5. ***MON IN:*** The MON IN jack will put signals directly onto the monitor bus. Crosstalk and buffering protection are provided by the input circuit and the signal level is controlled by the external source.

6. ***TAPE RETURN:*** These RCA jacks allow a tape deck or CD player to be directly connected to the mixer. The input is fed into the left and right subgroups and its level is controlled by the TAPE L and TAPE R front panel controls. These jacks can also be used as other AUX returns.

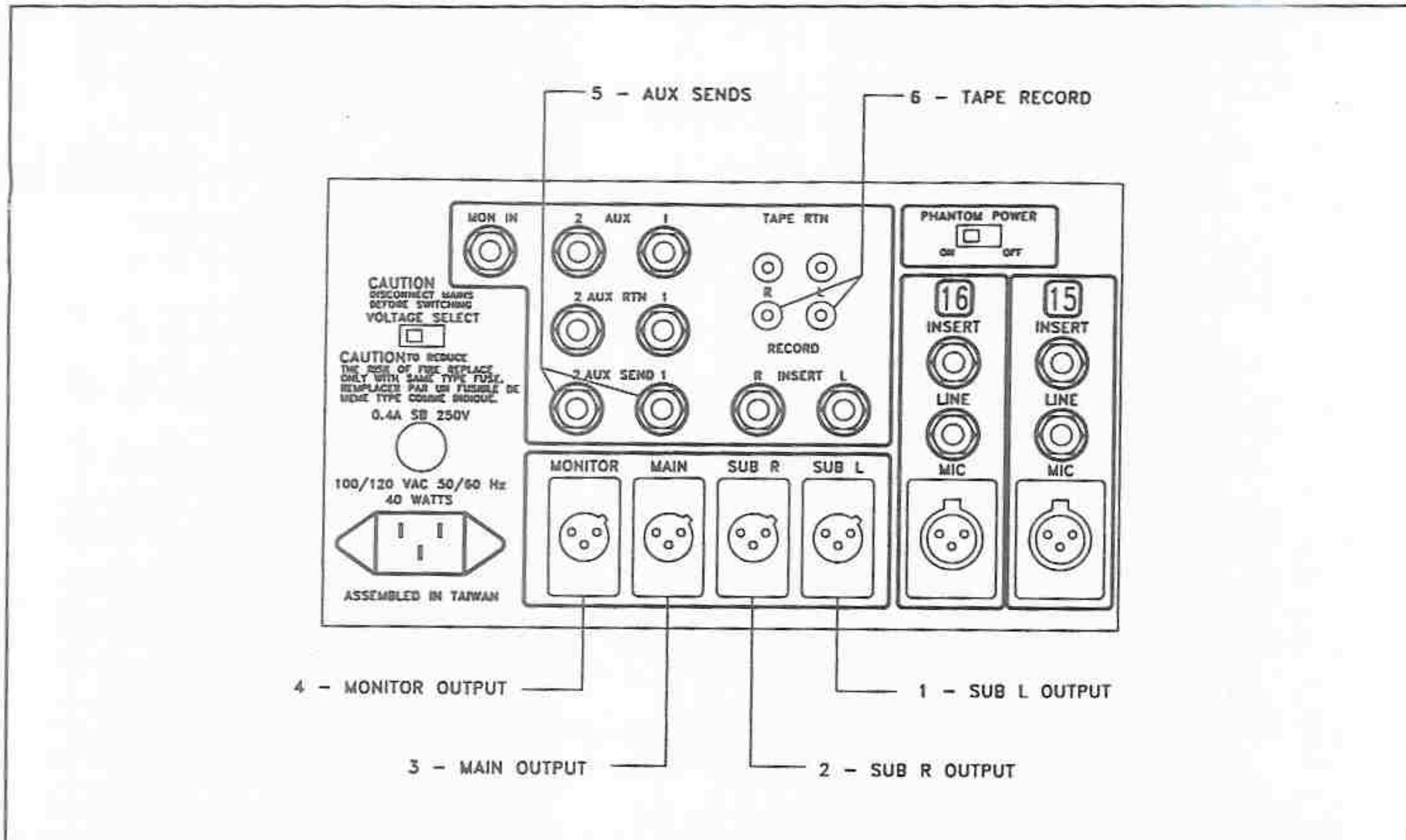


Figure 7. Rear panel output connectors.

7. ***INSERT L and R (SUB L and SUB R):*** A space-saving 3-conductor (stereo) phone jack is used for both output from SUB L and SUB R respectively, and for the return to the mixer's master section from an external processing device. Be sure that the device that is to be patched in has line level unbalanced inputs and outputs. The signal at the insert jack can drive loads of 2000 ohms or greater and the external processing device should have a low output internal impedance (100 ohms or less). Refer to Section 3.3 of this manual and Figure 3 for proper connections.

   A nominal input signal is a level of +4 dBu; the maximum level is +20 dBu.

8. ***Input Channel INSERTs:*** A space-saving, 3-conductor (stereo) phone jack is used for both output from the input channel and for the return to the input channel from an external processing device. Be sure that the device that is to be patched in has line level unbalanced inputs and outputs. The signal at the insert jack can drive loads of 2000 ohms or greater and the external processing device should have a low output internal impedance (100 ohms or less). Refer to Section 3.3 of this manual and Figure 3 for proper connections.

   A nominal input signal is a level of +4 dBu; the maximum level is +20 dBu.

4.4 Rear Panel Output Connections (Refer to Figure 7.)

In the **3300A** series mixers, the SUB L, SUB R, MAIN, and MONITOR outputs are servo-balanced and made through chassis-mount male 3-pin XLR-type connectors to a maximum level of +24 dBu (12.3 Vrms).

All other output connections are line level, unbalanced, and made through standard ¼-inch phone jacks (except for RECORD OUT).

1. ***SUB L Output:*** This left subgroup output is derived by summing all of the points (channels and external) assigned to the left subgroup bus. A PAN control rotated fully counterclockwise to the "L" position will assign that signal only to the left bus.

2. ***SUB R Output:*** This output is the right subgroup equivalent of the SUB L output.

3. ***MAIN Output:*** The MAIN output is the summed mix of

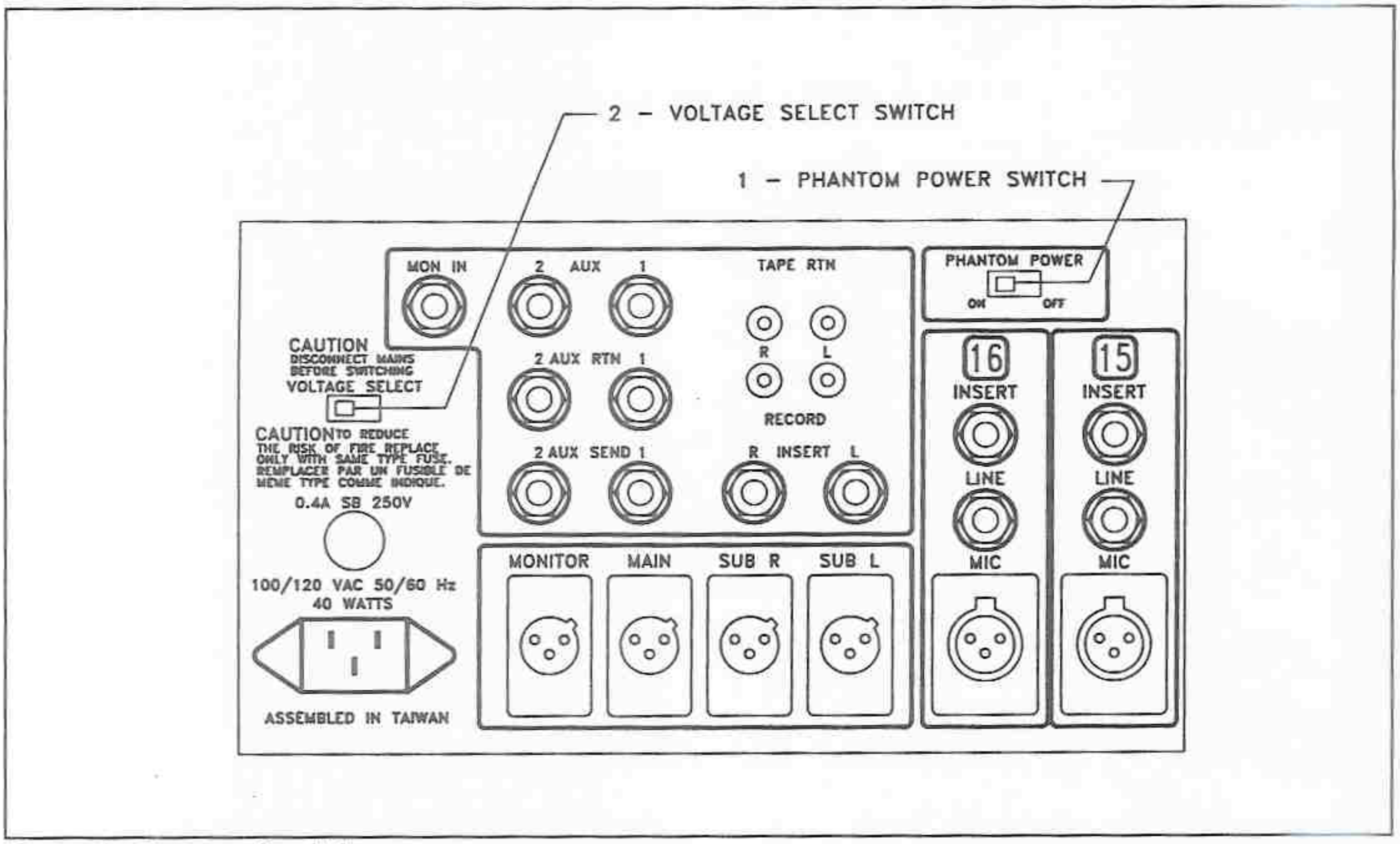


Figure 8. Rear panel switches.

the left and right subgroup outputs. Since the **3300A** series are true subgroup mixers, all signals that appear in the main mix must come through the subgroup channels.

4. ***MONITOR Output:*** The MONITOR output signal is the sum of all the input channel monitor sends and the external monitor input signal.

5. ***AUX SEND (AUX 1 and AUX 2):*** The AUX SEND output signal is the sum of all of the input channel AUX sends (PRE or POST fader) plus any signal coming through the AUX IN input.

6. ***TAPE RECORD:*** These output signals are the sum of all the input channels and effects with their position in the L + R stereo mix. The TAPE RECORD output is via RCA-jacks fixed at -10 dBV for easy interfacing and compatibility with semi-pro and hi-fi tape decks.

4.5 Rear Panel Switches

(Refer to Figure 8.)

1. ***PHANTOM POWER Switch:*** This switch turns the phantom power supply on and off. The phantom power supply provides power for condenser-type microphones through the microphone cable. When switched on, it provides 48 volts dc at pins 2 and 3 on all of the microphone input connectors. Pin 1 (the shield conductor) provides the ground return path. This will power standard condenser microphones. When switched on or off, the voltage will slowly ramp up or down; it takes a few seconds to reach full level. This prevents unwanted transients from reaching the microphone inputs. When the switch is engaged, a red LED will light on the meter bridge to confirm its operation.

2. ***VOLTAGE SELECT Switch:*** The **3300A** series are capable of operation at 115 or 230 Vac, 50 or 60 Hz. To safely accomplish a voltage change, follow these steps:

   1. Turn the mixer off and completely disconnect the ac power cord.

   2. If the unit is used for 115 Vac (100—120 Vac) operation, be sure a 0.4 amp Slo-Blo® 3AG fuse is installed in the fuse holder on the connector panel. If the unit is used for 230 Vac (220—240 Vac) operation, be sure a 0.25 amp Slo-Blo®

5×20 mm (supplied) fuse is installed in the fuse holder.

3. Change the chassis-mounted switch on the connector panel to the correct corresponding voltage.

4. Plug the power cord in the desired ac line and resume normal operation.

CAUTION: *Before attempting to move this switch, the mixer must be turned off and the power cord disconnected.*

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5 MOVEABLE REAR PANEL ON THE 3308A MIXER

One example of the versatility of the 3308A mixer is that it can be either rack-mounted in a standard 19-inch equipment rack or mounted in a table-top. To accommodate a rack-mount installation, the 3308A is supplied with its connector panel placed on its bottom. This prevents the input/output connectors from using up valuable vertical rack space.

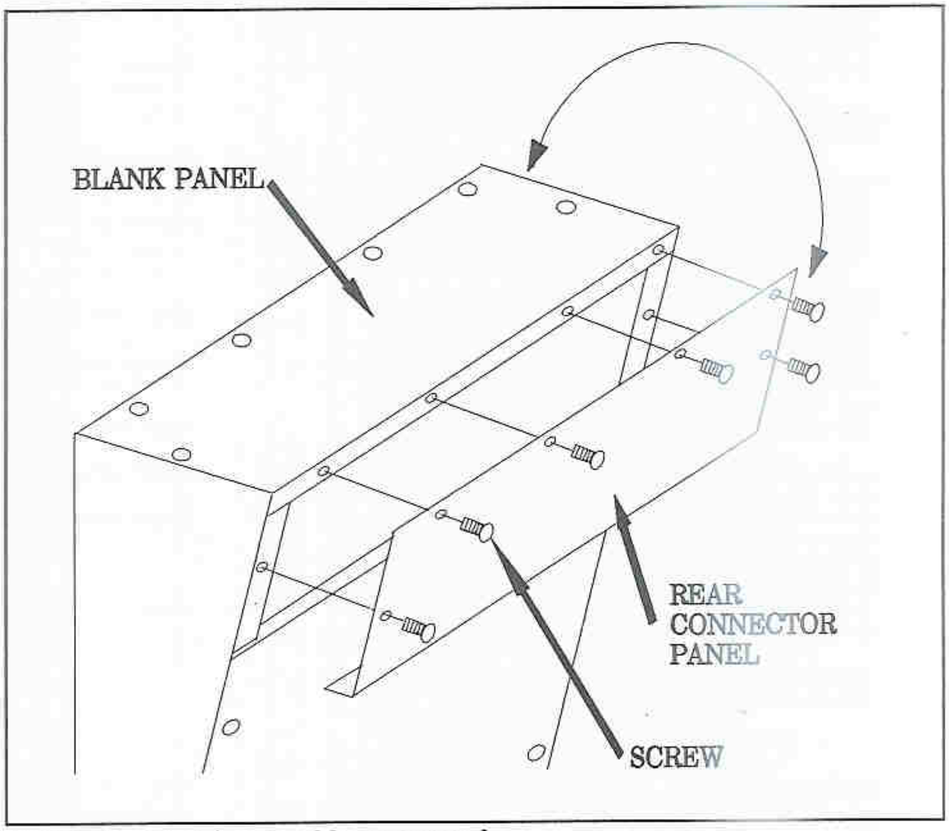


Figure 9. **3308A** moveable rear panel.

The connector panel may be moved to the rear of the mixer to accommodate a table-top installation. Refer to Figure 9 to move the connector panel to the rear. When moving this panel to the rear, care should be taken not to pinch any cables between the two panels.

6 WRITE-ON LABELS

In order to label each channel without marring the surface of the mixer, removable stick-on labels are available from any office supply outlet. Labels that are recommended are Presaply® Removable Labels by Dennison; part number Den-43-540; dimensions are ¾" × 1".

7 SYSTEM SPECIFICATIONS

Testing Conditions 120 Vrms, 60 Hz line voltage maintained.

Frequency Response
20 Hz – 20 kHz +1, –3 dB, +4 dBu in 600Ω

Total Harmonic Distortion
Less than 0.05%, 20 Hz – 20 kHz, +4 dBu in 600Ω
Less than 0.10%, 20 Hz – 20 kHz, +24 dBu in 600Ω

Noise
(A-weighted, R_s = 150Ω, Channel TRIM minimum)
–131 dBV Equivalent Input Noise.
–87 dBV Residual Noise.
–81 dBV SUB OUT, Master fader nominal, all Input faders minimum.
–78 dBV SUB OUT, Master fader and all Input faders nominal.
–77 dBV AUX SEND, Master fader nominal, all AUX sends minimum.
–77 dBV AUX SEND, Master fader and all AUX sends nominal.

Maximum Voltage Gain (±3 dB)
78 dB CH IN to SUB OUT & MON OUT
86 dB CH IN to MAIN OUT
52 dB CH IN to CH INSERT
88 dB CH IN to AUX OUT (post CH fader)
20 dB AUX RETURN to SUB OUT & MON OUT
10 dB AUX IN to AUX OUT
10 dB MON IN to MON OUT

Input Channel Equalization
(15 dB maximum boost or cut) HIGH: 10 kHz (Shelving)
MID: 300 Hz – 5 kHz (Peaking)
LOW: 100 Hz (Shelving)

Input Channel Gain Control Lo-Z input: 40 dB (12 dB – 52 dB)
Hi-Z input: 38 dB (–11 dB – 27 dB)

Crosstalk
Adjacent channel inputs –65 dB typical at 1 kHz
Input to output –60 dB typical at 1 kHz

VU Meters (All meters are calibrated for 0 VU = +4 dBu output.)
2 illuminated meters LEFT/MAIN, RIGHT/MONITOR/PFL

Clip Indicators
Input Channel: +16 dBu (4 dB before clipping)
VU Meters: +14 dBu (10 dB before clipping)

Lamp Connector 12 Vac, 375 mA maximum

Phantom Power
+48 Vdc on electronically balanced microphone inputs (6.8kΩ source impedance).

Power Requirements 115 V or 230 V, 50/60 Hz (switchable)

Power Consumption 50 W

Console Dimensions
3308A: 19"×6.63"×17.5" (483×168×445mm)
3316A: 29"×6.25"×20.75" (737×159×527mm)
3324A: 39"×6.25"×20.75" (991×159×527mm)

Console Net Weight
3308A: 27 lbs (12.3 kgs)
3316A: 40 lbs (18.2 kgs)
3324A: 53 lbs (24 kgs)

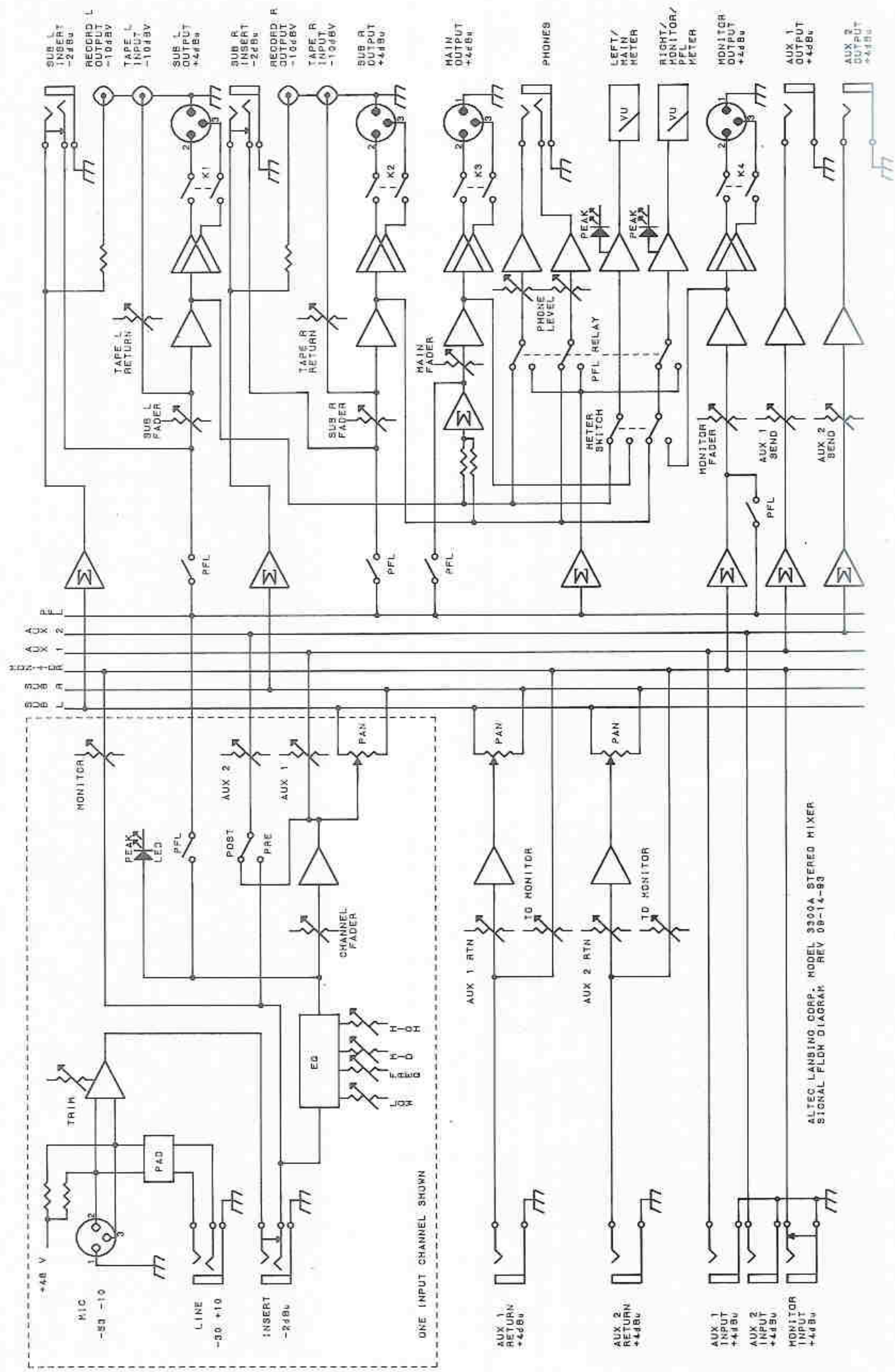
Altec Lansing continually strives to improve products and performance. Therefore, these specifications are subject to change without notice.

Input Terminals		Gain Trim	Actual Load Impedance	For Use with Nominal	Input Level Sensitivity	Input Level Nominal	Input Level Max. before Clip	Connector in Mixer
CH Input*	Lo-Z	52 dB	4.4kΩ	50–600Ω mics	–72 dBu (0.20mV)	–52 dBu (1.95mV)	–32 dBu (19.5mV)	XLR-3 female & Phone Jack (TRS)
	Hi-Z	27 dB	60kΩ	600Ω lines	–47 dBu (3.46mV)	–27dBu (34.6mV)	–7 dBu (346mV)	
AUX RETURN (1,2)			5kΩ	600Ω lines	–16 dBu (123mV)	+4 dBu (1.23V)	—	Phone Jack
INSERT IN	CH (1–*)		5kΩ	600Ω lines	–22 dBu (61.6mV)	–2 dBu (616mV)	+20 dBu (7.75V)	Phone Jack (TRS)
	SUB (L,R)		5kΩ	600Ω lines	–12 dBu (195mV)	–2 dBu (616mV)	—	
AUX IN, MON IN			20kΩ	600Ω lines	–6 dBu (388mV)	+4 dBu (1.23V)	+26 dBu (15.5V)	Phone Jack
TAPE RTN			5kΩ	600Ω lines	–20 dBV (100mV)	–10 dBV (316mV)	—	RCA Pin Jack

NOTES: (1) Sensitivity is the lowest level that will produce a SUB output of +4 dBu (1.23V), the nominal output level when the unit is set to maximum gain (all faders and level controls are in maximum position).
(2) XLR-3 type connectors are balanced. CH Phone Jacks are balanced (T = +, R = –, S = GND). Other Phone Jacks and RCA Pin Jacks are unbalanced. Insert Phone Jacks are unbalanced (T = OUT, R = IN, S = GND).
(3) * 3308A: 8 ch, 3316A: 16 ch, 3324A: 24 ch.

Output Terminals	Actual Source Impedance	For Use with Nominal	Output Level Nominal	Output Level Max. before Clip	Connector in Mixer
SUB OUT (L,R)	150Ω	600Ω lines	+4 dBu (1.23V)	+24 dBu (12.3V)	XLR-3 male
MAIN OUT	150Ω	600Ω lines	+4 dBu (1.23V)	+24 dBu (12.3V)	XLR-3 male
MONITOR OUT	150Ω	600Ω lines	+4 dBu (1.23V)	+24 dBu (12.3V)	XLR-3 male
AUX SEND (1,2)	100Ω	10kΩ lines	+4 dBu (1.23V)	+20 dBu (7.75V)	Phone Jack
CH INSERT (1–*)	100Ω	10kΩ lines	–2 dBu (616mV)	+20 dBu (7.75V)	Phone Jack (TRS)
SUB INSERT (L,R)	75Ω	10kΩ lines	–2 dBu (616mV)	+20 dBu (7.75V)	Phone Jack (TRS)
TAPE RECORD (L,R)	750Ω	10kΩ lines	–10 dBV (316mV)	+10 dBV (3.16V)	RCA Pin Jack
PHONES OUT	100Ω	8Ω phones	1 mW	25 mW	Stereo Phones Jack
		40Ω phones	3 mW	75 mW	

NOTES: (1) XLR-3 type connectors are balanced. CH Phone Jacks are balanced (T = +, R = –, S = GND). Other Phone Jacks and RCA Pin Jacks are unbalanced. Insert Phone Jacks are unbalanced (T = OUT, R = IN, S = GND).
(2) * 3308A: 8 ch, 3316A: 16 ch, 3324A: 24 ch.



SIGNAL FLOW DIAGRAM

Notes: